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Test 1457: John Deere 4050 Powershift Diesel 15-Speed

Tractor Museum
University of Nebraska-Lincoln, TractorMuseumArchives@unl.edu

NEBRASKA TRACTOR TEST 1457
JOHN DEERE 4050 POWERSHIFT DIESEL
15 SPEED

POWER TAKE-OFF PERFORMANCE

Power Hp (kW)	Crank shaft speed rpm	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temperature °F (°C) Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg (kPa)
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—Two Hours (PTO Speed—1002 rpm)								
100.95 (75.28)	2200	6.692 (25.332)	0.463 (0.281)	15.08 (2.972)	186 (85.7)	60 (15.3)	75 (23.9)	29.080 (98.199)
VARYING POWER AND FUEL CONSUMPTION—Two Hours								
87.86 (65.52)	2249	6.089 (23.049)	0.484 (0.294)	14.43 (2.843)	183 (83.9)	59 (15.0)	75 (23.9)	....
0.00 (0.00)	2353	2.533 (9.588)	....	....	171 (77.2)	60 (15.3)	74 (23.6)	....
44.87 (33.46)	2298	4.145 (15.691)	0.645 (0.392)	10.83 (2.132)	178 (80.8)	58 (14.7)	74 (23.6)	....
101.32 (75.55)	2200	6.665 (25.230)	0.459 (0.279)	15.20 (2.994)	186 (85.8)	59 (15.0)	75 (23.9)	....
22.71 (16.93)	2327	3.393 (12.844)	1.042 (0.634)	6.70 (1.318)	174 (78.6)	60 (15.3)	76 (24.2)	....
66.47 (49.57)	2269	5.061 (19.158)	0.531 (0.323)	13.13 (2.587)	181 (82.8)	60 (15.8)	76 (24.7)	....
Av 53.87	**2283**	**4.647**	**0.602**	**11.59**	**179**	**59**	**75**	**29.055**
Av (40.17)		***(17.591)***	***(0.366)***	***(2.284)***	***(81.6)***	***(15.2)***	***(24.0)***	***(98.114)***

DRAWBAR PERFORMANCE

Power Hp (kW)	Drawbar pull lbs (kN)	Speed mph (km/h)	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr (l/h)	lb/hp.hr (kg/kW.h)	Hp.hr/gal (kW.h/l)	Temp. °F (°C) Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg (kPa)
Maximum Available Power—Two Hours 10th Gear											
83.95 (62.60)	5334 (23.73)	5.90 (9.50)	2200	4.32	6.665 (25.229)	0.554 (0.337)	12.60 (2.481)	184 (84.2)	47 (8.3)	58 (14.2)	28.850 (97.422)
75% of Pull at Maximum Power—Ten Hours 10th Gear											
67.04 (49.99)	4132 (18.38)	6.08 (9.79)	2248	3.41	5.733 (21.702)	0.597 (0.363)	11.69 (2.304)	179 (81.8)	51 (10.3)	53 (11.5)	28.931 (97.696)
50% of Pull at Maximum Power—Two Hours 10th Gear											
45.65 (34.04)	2755 (12.25)	6.22 (10.00)	2275	2.52	4.730 (17.904)	0.723 (0.440)	9.65 (1.901)	174 (78.9)	43 (5.8)	43 (6.1)	28.470 (96.139)
50% of Pull at Reduced Engine Speed—Two Hours 13th Gear											
45.62 (34.02)	2755 (12.25)	6.21 (9.99)	1389	2.44	3.440 (13.021)	0.526 (0.320)	13.26 (2.613)	175 (79.2)	49 (9.2)	49 (9.4)	28.300 (95.565)
MAXIMUM POWER IN SELECTED GEARS											
71.16 (53.06)	11058 (49.19)	2.41 (3.88)	2224	14.61	4th Gear			178 (81.1)	34 (1.1)	41 (5.0)	29.090 (98.233)
80.02 (59.67)	10695 (47.57)	2.81 (4.52)	2198	12.73	5th Gear			181 (82.5)	34 (1.1)	40 (4.4)	29.100 (98.266)
85.10 (63.46)	9653 (42.94)	3.31 (5.32)	2200	9.42	6th Gear			181 (82.5)	35 (1.7)	42 (5.6)	29.060 (98.131)
87.11 (64.96)	8370 (37.23)	3.90 (6.28)	2198	7.16	7th Gear			184 (84.2)	38 (3.3)	46 (7.8)	28.910 (97.625)
84.30 (62.86)	7124 (31.69)	4.44 (7.14)	2199	5.78	8th Gear			182 (83.3)	37 (2.8)	44 (6.7)	28.910 (97.625)
84.37 (62.92)	6135 (27.29)	5.16 (8.30)	2198	4.93	9th Gear			181 (82.8)	35 (1.7)	40 (4.4)	28.910 (97.625)
86.43 (64.45)	5509 (24.51)	5.88 (9.47)	2199	4.43	10th Gear			182 (83.1)	34 (1.1)	42 (5.6)	29.050 (98.097)
84.68 (63.14)	4650 (20.68)	6.83 (10.99)	2199	3.85	11th Gear			184 (84.4)	41 (5.0)	49 (9.4)	28.910 (97.625)
88.75 (66.18)	4226 (18.80)	7.88 (12.67)	2200	3.41	12th Gear			184 (84.4)	43 (6.1)	51 (10.6)	28.910 (97.625)
86.07 (64.18)	3287 (14.62)	9.82 (15.81)	2200	2.59	13th Gear			184 (84.2)	45 (7.2)	53 (11.7)	28.890 (97.557)

LUGGING ABILITY IN 10th GEAR

Crankshaft Speed rpm	2199	1980	1761	1543	1318	1104	887
Pull—lbs (kN)	5509 (24.51)	6050 (26.91)	6515 (28.98)	6943 (30.88)	7210 (32.07)	7318 (32.55)	7071 (31.45)
Increase in Pull %	0	10	18	26	31	33	28
Power—Hp (kW)	86.43 (64.45)	85.07 (63.44)	81.16 (60.52)	75.42 (56.24)	66.68 (49.72)	56.55 (42.17)	43.96 (32.78)
Speed—Mph (km/h)	5.88 (9.47)	5.27 (8.49)	4.67 (7.52)	4.07 (6.56)	3.47 (5.58)	2.90 (4.66)	2.33 (3.75)
Slip %	4.43	4.93	5.36	5.78	6.06	6.20	6.20

TRACTOR SOUND LEVEL WITH CAB	**2000 RPM dB(A)**	**2200 RPM dB(A)**
Maximum Available Power—Two Hours	74.0	73.5
75% of Pull at Maximum Power—Ten Hours		74.0
50% of Pull at Maximum Power—Two Hours		73.0
50% of Pull at Reduced Engine Speed—Two Hours		70.0
Bystander in 15th gear		88.0

Department of Agricultural Engineering

Dates of Test: October 12 to November 11, 1982

Manufacturer: JOHN DEERE TRACTOR WORKS, P.O. Box 270, Waterloo, Iowa 50702

FUEL, OIL AND TIME: Fuel No. 2 Diesel **Cetane No.** 46.6 (rating taken from oil company's inspection data) **Specific gravity converted to 60°/60° *(15°/15°)*** 0.8379 **Fuel weight** 6.977 lbs/gal *(0.836 kg/l)* **Oil SAE** 15W-40 **API service classification** CD, CC, SD **To motor** 3.853 gal *(14.585 l)* **Drained from motor** 3.722 gal *(14.088 l)* **Transmission and hydraulic lubricant** John Deere Hy-Gard transmission and hydraulic fluid **Total time engine was operated** 48.5 hours.

ENGINE: Make John Deere Diesel **Type** six cylinder vertical **Serial No.** *RG6466D230839* **Crankshaft** lengthwise **Rated rpm** 2000 to 2200 **Bore and stroke** 4.57″ × 4.75″ *(116.0 mm × 120.6 mm)* **Compression ratio** 17.0 to 1 **Displacement** 466 cu in *(7636 ml)* **Starting system** 12 volt **Lubrication** pressure **Air cleaner** two paper elements **Oil filter** one full flow paper cartridge **Oil cooler** engine coolant heat exchanger for crankcase oil, radiator for hydraulic and transmission oil **Fuel filter** one paper cartridge and prestrainer **Muffler** vertical **Cooling medium temperature control** two thermostats and variable speed fan.

CHASSIS: Type standard with duals **Serial No.** *RW4050P001133* **Tread width** rear 60.0″ *(1524 mm)* to 114″ *(2890 mm)* front 56″ *(1420 mm)* to 82.6″ *(2099 mm)* **Wheel base** 106.7″ *(2710 mm)* **Center of gravity** (without operator or ballast, with minimum tread, with fuel tank filled and tractor serviced for operation) Horizontal distance forward from center-line of rear wheels 30.0″ *(762 mm)* Vertical distance above roadway 43.0″ *(1092 mm)* Horizontal distance from center of rear wheel tread 0.4″ *(10 mm)* to the left **Hydraulic control system** direct engine drive **Transmission** selective gear fixed ratio with full range operator controlled powershift **Advertised speeds mph *(km/h)*** first 1.2 *(2.0)* second 1.8 *(2.9)* third 2.1 *(3.4)* fourth 2.7 *(4.4)* fifth 3.1 *(5.1)* sixth 3.6 *(5.7)* seventh 4.1 *(6.6)* eighth 4.6 *(7.4)* ninth 5.3 *(8.5)* tenth 6.0 *(9.7)* eleventh 6.9 *(11.1)* twelfth 8.0 *(12.8)* thirteenth 9.8 *(15.8)* fourteenth 13.4 *(21.6)* fifteenth 16.6 *(26.7)* reverse 1.5 *(2.4)*, 2.2 *(3.5)*, 3.3 *(5.4)*, 5.0 *(8.0)* **Clutch** wet multiple disc hydraulically power actuated and operated by foot pedal **Brakes** wet disc hydraulically power actuated and operated by two foot pedals which can be locked together **Steering** hydrostatic **Turning radius** (on concrete surface with brake applied) right 146″ *(3.7 m)* left 146″ *(3.7 m)* (on concrete surface without brake) right 157″ *(4.0 m)* left 157″ *(4.0 m)* **Turning space diameter** (on concrete surface with brake applied) right 295.8″ *(7.51 m)* left 295.8″ *(7.51 m)* (on concrete surface without brake) right 326.9″ *(8.30 m)* left 326.9″ *(8.30 m)* **Power take-off** 540 rpm at 2201 engine rpm and 1002 rpm at 2200 engine rpm.

REPAIRS and ADJUSTMENTS: No repairs or adjustments.

SUPPLEMENTAL TESTS
POWER AND FUEL CONSUMPTION AT 2000 RPM
POWER TAKE-OFF PERFORMANCE

Power Hp *(kW)*	Crank shaft speed rpm	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temperature °F *(°C)* Cooling medium	Air wet bulb	Air dry bulb	Barometer inch Hg *(kPa)*
MAXIMUM POWER AND FUEL CONSUMPTION								
Rated Engine Speed—One Hour (PTO Speed—912 rpm)								
100.83	2000	6.338	0.439	15.91	188	59	76	29.075
(75.19)		*(23.992)*	*(0.267)*	*(3.134)*	*(86.7)*	*(15.2)*	*(24.2)*	*(98.182)*

DRAWBAR PERFORMANCE

Power Hp *(kW)*	Drawbar pull lbs *(kN)*	Speed mph *(km/h)*	Crank-shaft speed rpm	Slip %	Fuel Consumption gal/hr *(l/h)*	lb/hp.hr *(kg/kW.h)*	Hp.hr/gal *(kW.h/l)*	Temp. °F *(°C)* Cool-ing med	Air wet bulb	Air dry bulb	Barom. inch Hg *(kPa)*
Maximum Available Power—Two Hours 10th Gear											
84.21	5912	5.34	2000	4.65	6.360	0.527	13.24	186	48	59	28.815
(62.79)	*(26.30)*	*(8.60)*			*(24.076)*	*(0.321)*	*(2.608)*	*(85.3)*	*(8.6)*	*(14.7)*	*(97.304)*
MAXIMUM POWER IN SELECTED GEARS											
85.47	9133	3.51	2000	8.17	7th Gear			185	40	48	28.910
(63.73)	*(40.62)*	*(5.65)*						*(84.7)*	*(4.4)*	*(8.9)*	*(97.625)*
86.05	6051	5.33	2003	5.00	10th Gear			182	33	40	29.040
(64.17)	*(26.91)*	*(8.58)*						*(83.3)*	*(0.6)*	*(4.4)*	*(98.064)*
88.33	4640	7.14	2002	3.70	12th Gear			185	44	52	28.900
(65.87)	*(20.64)*	*(11.49)*						*(85.0)*	*(6.7)*	*(11.1)*	*(97.591)*

TIRES, BALLAST AND WEIGHT		**With Ballast**	**Without Ballast**
Rear Tires	—No., size, ply & psi *(kPa)*	Four 18.4-34; 6; 12 *(85)*	Four 18.4-34; 6; 12 *(85)*
Ballast	—Liquid (each)	None	None
	—Test Equip. (each)	50 lb *(23 kg)*	None
Front Tires	—No., size, ply & psi *(kPa)*	Two 10.00-16; 6; 32 *(220)*	Two 10.00-16; 6; 32 *(220)*
Ballast	—Liquid (each)	None	None
	—Test Equip. (each)	55 lb *(25 kg)*	None
Height of Drawbar		22.5 in *(570 mm)*	22.5 in *(570 mm)*
Static Weight with Operator—Rear		9370 lb *(4250 kg)*	9170 lb *(4160 kg)*
Front		3660 lb *(1660 kg)*	3550 lb *(1610 kg)*
Total		13030 lb *(5910 kg)*	12720 lb *(5770 kg)*

REMARKS: All test results were determined from observed data obtained in accordance with SAE and ASAE test codes or official Nebraska test procedure. For the maximum power tests, the fuel temperature at the injection pump was maintained at 113°F *(45.0°C)*. Ten gears were chosen between 15% slip and 10 mph *(16.1 km/h)*.

We, the undersigned, certify that this is a true and correct report of official Tractor Test No. **1457.**

LOUIS I. LEVITICUS
Engineer-in-Charge

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John Deere 4050 Powershift Diesel

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